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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,742	12/02/2003	Hung Kun Chen	CHEN3608/EM	2098

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EXAMINER	
FILE, ERIN M	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/724,742

Applicant(s)

CHEN, HUNG KUN

Examiner

Erin M. File

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection. The deficiencies which are purported in the Ibrahim publication have been overcome by the combination with the Vanderstein publication.
2. In response to applicant's argument that Foster is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Foster is directed towards correctly receiving digital data which could be reasonably combined with Ibrahim and Vanderstein.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibrahim et al. (U.S. Pub. No. 2004/0052306) in view of Vanderstein et al. (U.S. Pub. No. 2001/0044915).

Claims 1, 6, Ibrahim discloses:

- Reconstructing input data symbols ($X'_k[n]$) the original data symbols ($X_k[n]$) (fig. 3, 104, [0038], line 7);
- delaying the actual received data symbols ($R_k[n]$) such that the delayed actual received data symbols ($Q_k[n]$) are synchronous to the reconstructed input data symbols ($X'_k[n]$) ([0061], lines 7-8, fig. 8, 118);
- calculating a channel response estimate ($W_k[n]$) of one subchannel k based on said delayed actual received data symbols ($Q_k[n]$) and said reconstructed input data symbols ($X'_k[n]$) according to the Least Mean Square algorithm ([0059], lines 4-5, describes an alternate LMS embodiment of the channel response determination module 106 of fig. 3, see fig. 3 which shows channel response determination module 106 determined from delayed spread spectrum complex baseband samples 112 and reconstructed spread spectrum complex baseband samples);
- estimating received data symbols ($Y_k[n]$) based on said channel response estimate ($W_k[n]$) and the input data symbol ($X'_k[n]$) (see fig. 8. reconstructed baseband samples are multiplied by multipliers 164 with estimated channel response $c(1..n)$ and summed);

- and calculating a different quantity ($e_k[n]$) between the delayed actual received data symbol ($Q_k[n]$) and the estimated received data symbols ($Y_k[n]$) to represent the channel noise of said subchannel k ([0061], lines 6-8, see fig. 8, reconstructed signal 116 is input to summing module 168 along with delayed spread spectrum baseband sample 112 to create error signal 174).

Ibrahim fails to disclose reconstructing *simulated* input data symbols that *simulate* the original data symbols, however, Vanderstein discloses simulating received data and estimating *virtual* received data symbols ([0006]), which Vanderstein discloses is used to predict bit error rates having the advantage of lowering the incidence of error in reconstructed data symbols ([0005]). Because of this advantage, it would have been obvious to one skilled in the art at the time of invention to incorporate the virtual data simulation as disclosed by Vanderstein into the invention of Ibrahim.

Claims 2, 8, Ibrahim further discloses in the simulated input data symbols ($X'_k[n]$) reconstructing act, the original data symbols ($X'_k[n]$) being taken as the simulated input data symbols ($X'_k[n]$) while the original data symbols ($X_k[n]$) are exactly known to the receiving unit [(0007), lines 4-6].

Claims 3, 9, Ibrahim further discloses de-mapping and decoding the actual received data symbols ($R_k[n]$) on each subchannel k to extract bit-stream data and encoding and mapping said bit-stream data to reconstruct said simulated input data symbols ($X'_k[n]$) ([0032], lines 7-8) .

5. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibrahim et al. (U.S. Pub. No. 2004/0052306) and Vanderstein et al. (U.S. Pub. No. 2001/0044915) as applied to claims 3 and 9 above, and further in view of ten Brink (U.S. Patent No. 6,611,513).

Claims 4, 10, neither Ibrahim nor Vanderstein disclose the simulated input data symbols ($X'_k[n]$) reconstructing act further has a de-interleaving act after the actual received data symbols ($R_k[n]$) de-mapping act, and an interleaving act after the bit-stream data encoding act, however, ten Brink discloses a de-interleaving act after the actual received data symbols ($R_k[n]$) de-mapping act, and an interleaving act after the bit-stream data encoding act (fig. 3, data from demapper 29 is fed to de-interleaver 26, coded bits $L_{D,p}$, are fed into interleaver 28). Because the interleaving of data is well known in the art for increasing data processing speed, it would have been obvious to one skilled in the art at the time of invention to incorporate the interleaving and deinterleaving of the data as disclosed by ten Brink into the combined invention of Ibrahim and Vanderstein.

6. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibrahim et al. (U.S. Pub. No. 2004/0052306) and Vanderstein et al. (U.S. Pub. No. 2001/0044915) as applied to claims 1 and 8 above, and further in view of Foster (U.S. Pub. No. 2005/0063493).

Claims 5, 11, neither Ibrahim nor Vanderstein disclose in the simulated input data symbols ($X'_k[n]$) reconstructing act, said actual received data symbols ($R[n]$) on the

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subchannel k being directly mapped to form the simulated input data symbol ($X'_k[n]$) for said subchannel k , however, Foster discloses actual received data symbols ($R[n]$) on the subchannel k being directly mapped to form the simulated input data symbol ($X'_k[n]$) for said subchannel k (p. 8, line 98). Because Foster discloses that his reception method significantly reduces data detection complexity (abstract, lines 7-8), it would have been obvious to one skilled in the art at the time of invention to incorporate the direct mapping of the data as disclosed by Foster into the combined invention of Ibrahim and Vanderstein.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ibrahim et al. (U.S. Pub. No. 2004/0052306) as applied to claim 6 above, and further in view of Isozaki (U.S. Patent No. 5,406,569).

Claim 7, neither Ibrahim nor Vanderstein disclose while the original data symbols ($X_k[n]$) are exactly known to the receiving unit, the reconstructing unit takes the original data symbols ($X_k[n]$) as the simulated input data symbols ($X'_k[n]$), and the actual received data symbols are directly passed through the delay line without a delaying process, however, Isozaki discloses while the original data symbols ($X_k[n]$) are exactly known to the receiving unit, the reconstructing unit takes the original data symbols ($X_k[n]$) as the simulated input data symbols ($X'_k[n]$), and the actual received data symbols are directly passed through the delay line without a delaying process (col. 8, lines 8-11). The bypassing of delay means would reduce the overall computational time of the estimation process and would have therefore been obvious to one skilled in the art at


the time of invention to incorporate the error calculation as disclosed by Isozaki into the combined invention of Ibrahim and Vanderstein.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin M. File whose telephone number is 5712726040. The examiner can normally be reached on M-F 1-9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 5712723024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Erin M. File/
Assistant Examiner, AU 2611
6/27/2007


DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER